Statement of Qualifications

Superfund Sites

Prepared for:

NORCO and EPA Region 6

Prepared by:

TRC

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9568724

TRC EXPERIENCE

- ✓ Ownership
- ✓ Experience and Expertise
- ✓ Partnership

TRC Environmental Corporation (TRC) is pleased to submit to National Oil Recovery Corporation (NORCO) and EPA Region 6 (EPA) this Statement of Qualifications (SOQ). TRC is able to support NORCO at the Falcon Refinery Superfund Site in Ingleside, Texas as we have other clients with EPA led superfund sites. TRC recognizes that NORCO is into the Phase II work plan of the RI/FS at the Falcon Refinery in Ingleside, Texas.

TRC's successful track record manifests itself on many fronts, through completed and current projects. By virtue of TRC's Exit Strategy Program we are the owner of site liability (often times as a PRP), and in many instances our work has been overseen by the EPA. We have specific sites where the regulatory action is brought forward specifically to resolve refinery issues with sediment impacts. We are prepared to offer a team of experts to support NORCO in achieving the project goals.

TRC is a step above the rest. Our uniqueness stems from our **Ownership, Experience and Expertise, and Partnership** on similar projects. The following section provides information on our distinct capabilities as well as our knowledge of the EPA process for compliance and issue resolution.

OWNERSHIP

TRC brings a unique understanding through ownership of environmental liabilities, including those established specifically for Superfund sites. Ownership allows TRC to look beyond the assessment and remediation, and determine long-term financial and technical implications. From an owner's perspective, TRC is driven to work efficiently, be right the first time, establish and reach an end goal, and work with regulatory agencies to recognize key investigation needs while avoiding making the investigation phase into a research project. This ownership experience allows TRC to be goal-aligned with the site owners of the environmental liabilities. The list of TRC owned projects includes RI/FS efforts with multiple PRPs. TRC personnel identified for this project have worked extensively on these sites and will offer the benefits of their experience. Nationally, TRC owns environmental liability for 95 major and 137 ancillary sites with 36 major and 137 ancillary sites located in Louisiana, Texas, Arkansas, and Mississippi.

TRC has dealt successfully with technical and regulatory project issues as well as the management of stakeholders (PRPs and EPA). Two key projects highlight this experience. First, TRC successfully addressed PCBs in sediments at the Hayton Area Remediation Project (HARP), which was delayed for years. TRC accomplished plans for operable units (OUs) 2 and 3 during the first year and proceeded to the field the following construction season. The second project was at the Harbor Island Superfund Site (Lockheed Martin) where TRC succeeded by moving from 30% design to Operation and Maintenance (O&M) in two years. These fast-tracked projects allowed for significant project savings. The two projects are described in more detail below. Additional superfund case histories are provided in Appendix A.

Hayton Area Remediation Project, New Holstein, WI

Through TRC's Exit Strategy® program, TRC assumed liability and responsibility for the remediation of several miles of creek and pond sediments and soils, previously impacted by PCBs from historical industrial operations. The project scope included extensive investigation of the nature and extent of PCBs in in-channel sediments and overbank soils, definition of soil and sediment characteristics, geomorphic analysis of creek characteristics to support development of risk-based removal levels, removal of soils/sediments above agency-negotiated concentrations, long-term monitoring, and community relations activities. TRC negotiated investigations, permitting, removal levels, and remediation plans with Wisconsin Department of Natural Resources (WDNR) and USEPA, Region V. The size, complexity, and cost ($15.7M) of the project required TRC to closely monitor every step in the project and to ensure services provided were focused on achieving project goals. Services completed are provided below.

Services Provided

- **Site Investigation and Remediation Planning.** TRC prepared site investigation work plans and negotiated approach with WDNR and USEPA. TRC also prepared remediation scope of work plans that met regulatory approval.
- **Field Sampling.** TRC managed the field sampling program, including direction of subcontractors during collection of soil and sediment borings, and collected all soil, sediment, and groundwater samples for analysis. TRC collected over 3,000 samples to evaluate the PCB impacts in the 5 miles of Pine Creek and the 30 acre Millpond. Coordinated all analytical testing with the laboratory to meet WDNR requirements (e.g., analytical methods, detection limits, quality assurance/quality control measures, etc.).
- **Data Analysis and Regulatory Reporting.** Completed site investigation reports, including organization and interpretation of analytical data to define nature and extent of PCBs. Prepared recommendations for No Further Action or corrective action based on interpretation of the analytical results and geomorphology. Employed risk-based decision-making in the development of conclusions and recommendations in accordance.
- **Regulatory Negotiation and Coordination.** Coordinated with WDNR and USEPA to resolve issues quickly and obtain work plan approvals. Project execution was contingent on obtaining approvals from WDNR and USEPA. Coordinated and negotiated wetland mitigation and restoration plan with WDNR and United States Army Corps of Engineer (USACE).

- **Permitting.** TRC conducted permitting activities for the remediation of in-channel sediments and overbank soils contaminated with PCBs. Several permits were required before remediation activities could be initiated, including the Wisconsin Statutes (Wis. Stats.) Chapter 30 and Clean Water Act (CWA) 404 waterway and wetlands permit approval, NR 216 construction site storm water discharge permit, Wis. Stats. 283.35 wastewater discharge permit, and Threatened and Endangered Species Incidental Take Authorization. In preparing and obtaining the permits, TRC completed a hydrology model, wetlands delineation, plans, specifications, national heritage inventory, habitat assessment, and state historic preservation office (SHPO) search. TRC prepared a Wetland Mitigation Plan, a Greater Redhorse Conservation Plan, and an Environmental Assessment.

- **Site Remediation.** In 2008, TRC started the first phase of remediation requiring excavation of in-channel sediment and overbank soils. To facilitate remediation of sediments from the excavation zones, flow from Pine Creek was diverted around each removal zone to minimize sediment transport during remediation and facilitate materials handling. Removal limits of 1 mg/kg for in-channel sediments and 5 mg/kg for overbank soils were approved. Excavation progressed in sections from upstream to downstream locations and was accomplished using a track-mounted backhoe to load the material into tracked dump trucks. TSCA and non-TSCA wastes were staged at the excavation zones separately. Post-remedial verification (PRV) samples were collected as an independent means to verify remediation. TRC managed the soil and sediment excavation, which was disposed offsite at permitted disposal facilities. During remediation, TRC conducted timely evaluation to plan downstream excavations and PRV sampling. TRC coordinated and communicated with WDNR and USEPA regularly to document remediation and PRV sampling.

- **Site Restoration.** To offset impacts to wetlands, the restoration phase consisted of reconstructing the stream and floodplain to pre-project conditions to the most practicable extent possible. This work included backfilling and grading, stream bank reconstruction, and revegetation. Backfilling was completed to reconstruct the stream channel and bank and to maintain appropriate hydrology for plant communities. Stream bank re-construction involved

four types of treatments using a combination of biodegradable coir fabric, fabric encapsulated soil, and coir blocks. The purpose of these treatments was to re-establish the stream banks by replicating pre-remediation slopes. Coir fabric and blocks provided a method to sufficiently compact backfill material for bank restoration, will degrade over time, will allow vegetation to re-establish, and will not entrap wildlife. Revegetation consists of seeding and planting of rootstock and tree species suited to the hydrologic conditions established following excavation. Once established, vegetation will provide stream bank stability as the coir fabric degrades. Revegetation and wetland restoration and mitigation is being prepared per USACOE guidelines.

- **Construction Management and Oversight.** Managed onsite construction activities to facilitate remediation and restoration, including clearing and grubbing of the site, creek bypass, dewatering, management and disposal of PCB wastes, excavation and grading, fill placement and compaction, PRV sample collection, offsite transportation and disposal, stream bank reconstruction, surveying, seeding, and planting.

- **Public Relations.** TRC implemented a comprehensive community relations program. TRC issued newsletters and news releases to inform the community of our plans and keep them updated on project progress. TRC met with individual property owners to keep them updated on remedial work, and address their questions and concerns. TRC held a public informational meeting in coordination with permitting activities to update the public prior to the remediation.

Harbor Island Superfund Site

The Harbor Island Superfund Site-Lockheed Shipyard Sediment Operable Unit (LSSOU) is an OU of the Harbor Island Superfund Site in the Port of Seattle, Washington. The LSSOU and the adjacent upland area incorporate portions of the Superfund site were affected by shipyard operations at the former Lockheed Shipyard Number 1.

When TRC began the project, the project had been ongoing and completed by others for 8 years under the direction of USEPA Region 10. Within 7 months of obtaining the project, TRC completed the engineering and pre-mobilization activities, including site characterization, remedial design, project management, community relations, Natural Resource Damage settlements, and health and safety requirements. The final remedial design included the removal and containment of sediments within the OU that exceeded the applicable state regulatory standards for sediment quality. *Note:* Due to concerns regarding impacts to Tribal fishing rights, the state's standards for sediment quality are extremely restrictive.

To complete this remedy, the following work was completed:

- Rebuilding of the pier bulkhead
- Demolition of the 6,600 pilings
- Dredging, dewatering, and disposal of the 70,000 cubic yards of contaminated sediments
- Capping of the remaining sediments that exceed cleanup standards but were infeasible to remove

Several stakeholders were involved with the project including, EPA, USACE, the Washington Department of Ecology, the Port of Seattle, the Washington Department of Natural Resources, federal fisheries agencies, the Washington Department of Fish and Wildlife, and local Indian tribes, whose needs for environmental controls during construction must be addressed. TRC successfully obtained approval from regulators and stakeholders.

Before **After**

EXPERIENCE AND EXPERTISE

TRC has assembled a team of experienced professionals to provide NORCO all of the anticipated services stated in the SOQ. TRC's team was selected based on direct experience with NORCO, refineries, Superfund sites, and for vast experience with EPA and State and Federal Trustees including the Texas Commission on Environmental Quality (TCEQ), General Land Office (GLO), Texas Parks and Wildlife Department (TPWD), US Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration. The TRC team is the key to a successful, streamlined project. The project personnel selected were identified based on key project technical needs, which include the following:

- Strong local presence for key staff.
- Strong professional relationships, with EPA Region 6,
- Experience the RI/FS process and in preparation of work plans, and reports for Superfund liabilities.
- Refinery investigation and remediation experience, including sediments.
- Experience in working on both EPA and State lead CERCLA sites with multiple PRPs.

The majority of professionals that make up the TRC team have close ties and common histories that enhance our ability to mesh in a way that assures NORCO's goals and objectives are successfully and professionally fulfilled. Team members include PhD and Masters level engineers and scientists with more than 100 man years in engineering and consulting in the environmental field. TRC also have key personnel working from other TRC offices that will provide both technical expertise and support. At TRC, personnel are encouraged to work across offices, ensuring each project has the most qualified expert available.

TRC TEAM

The TRC team has conducted numerous environmental studies and investigations, remediation plans and engineering designs, and implemented cleanup under a variety of regulatory programs, including CERCLA, RCRA, and TSCA while meeting NEPA requirements. TRC personnel have worked on numerous refinery sites, which include investigation and remediation in sediments. This experience has allowed staff to use knowledge gained on past projects as a resource to "think outside the box" to address any issue at hand. TRC's highly qualified key team members are summarized below. Complete resumes are included in Exhibit 1.

TRC's proposed team has the ability to think outside the box.

Stephen Halasz P.G. will serve as the Project Coordinator and Task Leader for both the Regulatory Liaison and Community Relations tasks. He has effectively worked on other regulatory issues with the current USEPA project manager for this site and with the TCEQ. Stephen has coordinated Remedial Investigation (RI) and Feasibility Studies (FS) with soil, sediment and groundwater impacts at sites in Region 6 and has been the Project Coordinator at the Falcon Refinery since the AOC's for Removal Action and RI/FS were signed.

Mike Holder, P.G., PSS, CAPM will act as the Remedial Investigation Task Leader. He has over 20 years of experience and is a nationally recognized expert in petroleum investigation/remediation and Resource Conservation and Recovery Act (RCRA) compliance. He has worked for numerous Refining clients, including Marathon, BP, Chevron, Holly, PRSI, ConocoPhillips, and ExxonMobil Refineries across the country. His projects have included Resource Conservation and Recovery Act (RCRA) Part B permitting of hazardous waste management units, the characterization, retrofitting, closure of surface impoundments and other hazardous waste management units, Part B permit modifications and renewals, hazardous waste delistings, remedial investigations and cleanup of solid and hazardous waste sites; environmental assessment of proposed activities in sensitive areas and identification of adverse impacts and appropriate mitigation measures; regulatory compliance review and implementation of waste management and waste minimization activities under RCRA; permitting, management, and treatment of storm water and wastewater under the Clean Water Act (CWA), and remediation of hazardous waste sites under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), RCRA Corrective Action, and state cleanup programs.

Mark Killen, Ph.D., P.E. will act as a local Task Leader for Feasibility Studies and as a technical expert for PCB investigation. He has developed RI/FS work plans and reports at numerous sites including the Tennessee Gas Pipeline system. The Tennessee pipeline system included PCBs in sediments at Sibley Lake and other Louisiana sites. He has worked with other cooperating state and federal agencies in EPA Regions including EPA Region 6, Louisiana, Texas, Arkansas, Mississippi, Kansas, California, Nevada, Florida, and New Mexico, including USACE, Wildlife and Fisheries, LDEQ, ADEQ, TCEQ, LDNR. Dr. Killen's innovative design experience and ability to focus on the project goal will ensure a thorough, relevant, and complete FS.

Karen Vetrano, Ph.D. will act as Task Leader for Risk Assessment. Dr. Vetrano is currently conducting a human health risk assessment for a former illegal dumping site where PCBs are the primary contaminant of concern. She has conducted several similar assessments on numerous sites involving agency cooperation including EPA Region 6. She provides management and technical support for the various components of human exposure and health risk assessments under such programs as Superfund, Resource Conservation and Recovery Act (RCRA), California Proposition 65, the Massachusetts Contingency Plan (MCP) (as well as other individual State programs) and EPA's Brownfield Program.

PAST PROJECT EXPERIENCES

In addition to the team's experience provided above, the extent of TRC's expertise remains unsurpassed. The wide-ranged past project experience includes the following:

- Site investigation and characterization (including TRIAD Approach and EPA Corrective Action Strategy).
- Refinery sediment investigation, risk assessment and remediation.
- Engineering, geologic, and permitting support for the implementation of remediation systems in Texas and the Gulf Coast area.
- Design and application of innovative and effective remediation and closure of impacted properties.
- EPA/TCEQ land use revitalization programs, including Ready for Reuse, Brownfields, and Voluntary Remediation Program.
- Operation and management of sites after remedial actions are completed.

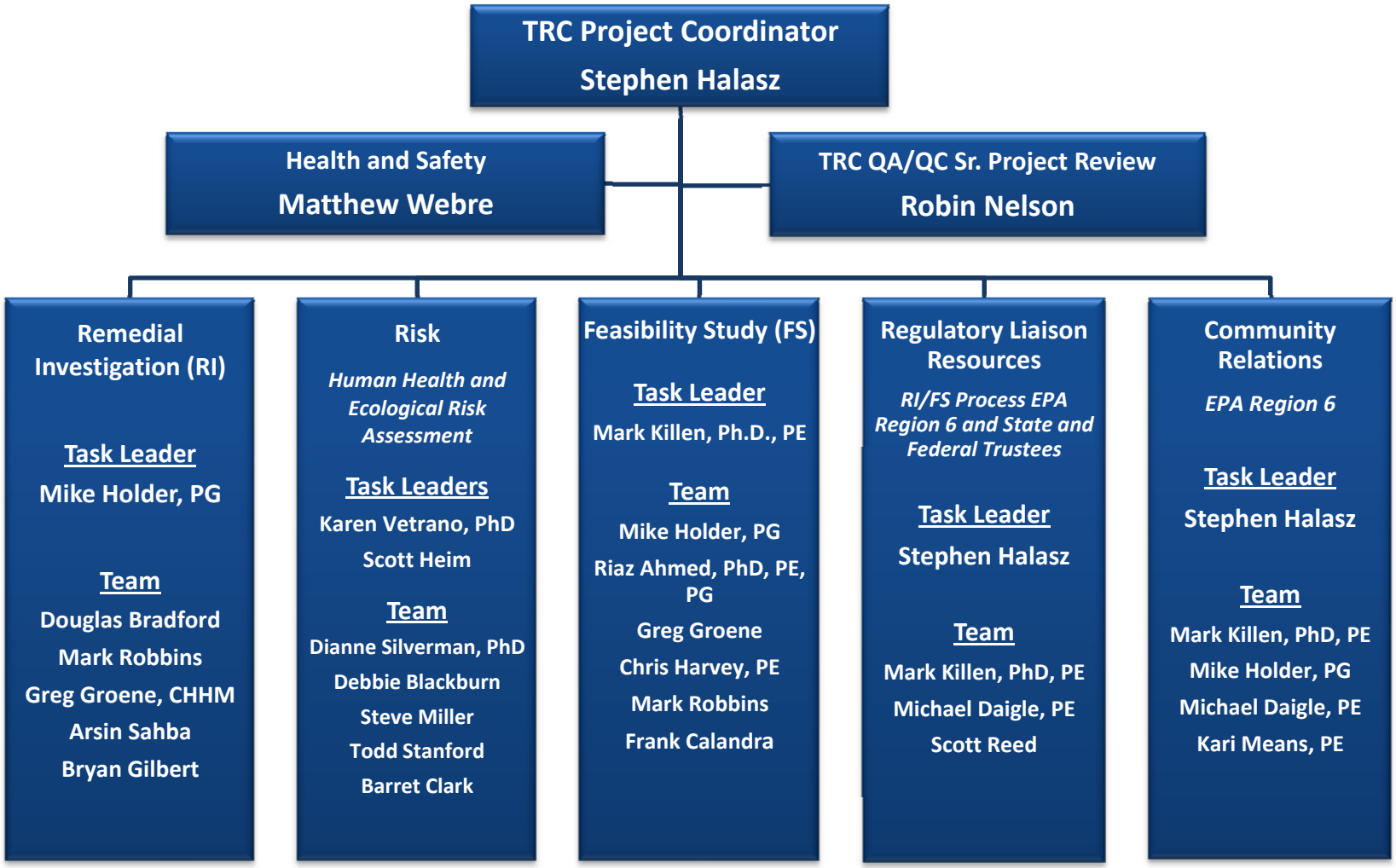
- Communicating site data and planned remedies to regulators and the general public.
- Regulatory negotiations extending back more than twenty years with the LDEQ, USEPA Regions II, IV and VI, USACE, TCEQ, and U.S. Minerals Management Service.

The following table shows TRC's experience relevant to the proposed project. These case studies are detailed in Exhibit 2 and document TRC's ability to manage Superfund sites and the CERCLA process; sediment projects; work execution in Louisiana, and project management with the USEPA and CERLCA.

TRC SUPERFUND PROJECTS

Site Name (Client)	Site Type	Site Contaminants	Engineering Phase	Waste Management Technology
Mattiace Superfund Site, TRC owns environmental liability	Chemical Disposal	Diverse list of chlorinated DNAPL, PAH & LNAPL	RAO, O&M	Biosparging, GW Pump & treat, air sparging, phytoremediation (proposed)
Cabot Carbon Superfund Site (Beazer East)	Wood Treating	Arsenic, chromium, PCB, PAHs, DNAPL	FS	Capping of soil; Slurry wall containment of groundwater
Feather River Superfund Site (Koppers)	Wood Treating	VOCs, metals, and dioxins/furans	RD, RAO	Excavation and placement in containment cells
Harbor Island Superfund Site (Lockheed Martin)	Shipyard	Not provided	FS, RD	Sediment removal (dredging) and containment; capping of remaining sediment
JH Baxter Superfund Site (Beazer East)	Wood Treating	Arsenic, chromium, copper, zinc, PCB, PAHs, DNAPL	RD, RAO	Excavation and placement in containment cell; Slurry wall containment of groundwater
Waste Disposal Inc. Superfund Site (Project Navigator)	Waste Disposal	Drilling muds, waste crude oil, VOCs, methane	FS, RD, O&M	Excavation and placement of soil under a RCRA cap; water collection and treatment system for reservoir liquids
Parker Landfill (USEPA)	Landfill	Not provided	RD, RAO	Cap
Portland-Bangor Waste Oil (USEPA)		Petroleum, lead, PCBs, solvents	FS, RD	Excavation, thermal treatment, stabilization, capping
Solvent Chemical Superfund Site	Chemical Site	Solvents, DNAPL	FS, RD	Soil cap; Groundwater extraction and treatment, including a grout curtain
Pownal Tannery Superfund Site (USEPA)	Tannery	Metals (chromium)	FS, RD	Excavation and consolidation of sludge and soil, cover with a RCRA cap
AT&SF Albuquerque Superfund Site (BNSF)	Tie Treating	PAHs (creosote), zinc, DNAPL	FS, RD	Excavation of soil, consolidation, stabilization, and capping; groundwater pump and treat; DNAPL removal
AT&SF Clovis Superfund Site (BNSF)	Clovis Railyard, Santa Fe Lake	Hydrocarbons, metals	FS, RD, RAO, O&M	Railyard: free-phase removal from groundwater (total fluids recovery) Lake: evaporation of lake water, bioremediation of sediments and soils, containment in capped area

TRC Organizational Chart



CLIENTS

A subset of TRC's investigation and remediation clients in the U.S. EPA Region 6 is presented below:

American Electric Poser
Baker Petrolite
BNSF
British Petroleum
CITGO Petroleum
Canadian National Railway
Coastal Refining & Marketing
Crosstex Energy Services
Duke Energy
Giant Industries
HWRT
Kaiser
Kansas City Southern Railway
Marathon Petroleum Company
Marathon Oil Company
Rohm and Haas Texas
Texas Department of Transportation
Union Pacific Railroad
Waste Management

CONFLICT OF INTEREST

TRC conducted an internal review of the list of EPA identified PRPs and did not identify any conflict of interest with this important project.

TECHNICAL PROPOSAL

The USEPA has a formalized program for conducting site investigation and remediation under Superfund. From the RI/FS to the Remedial Design (RD)/Remedial Action (RA), the program is established with significant precedence. Without experience in the key areas, a project is likely to be delayed. TRC's proposed key technical approach is to execute the project using the flexibility of the response action process, while maintaining compliance. Combining the knowledge of the program with the perspectives of involved parties is key in streamlining the process.

To reflect TRC's understanding of the RI/FS Process presented herein is a description of the process, briefly identifying the key elements and how effective management and implementation can positively affect the process.

REMEDIAL INVESTIGATION/FEASIBILITY STUDY PROCESS

The RI/FS process not only provides general site information, but also provides data needed to establish remedial goals. TRC anticipates that the development of a phased approach to the investigation is needed in efficiently defining and completing the investigation and developing the Conceptual Site Model used for the FS. Past project experience has shown that key project issues, including remediation goals, action areas, and target containment areas are refined throughout the entire RF/FS process. TRC has the experience and expertise to make cost effective, technically defensible, and implementable plans to meet the objectives for this RI/FS activity. The following sections provide the primary components to the RI/FS Process, along with TRC's technical approach.

WORK PLAN PREPARATION

TRC will carry out the approved Phase II Field Sampling Plan and all aspects of the approved RI/FS Work Plan.

Data Collection Preparation

In reviewing data for work plan preparation, TRC will use the existing data in an effective manner to identify data gaps for the investigation activities. The data review and gap analysis will include evaluating if the current data interpretation is a technically sound characterization of the nature and extent of the chemicals of concern. The additional data collection will focus on better definition of impacted area and source or potential sources, development of conceptual site model, coordinate with risk assessment so that sampling for each activity is efficient. No sample location will be identified, or sample collected without a clear purpose and understanding of the goal.

Conceptual Site Model

A key outcome of the investigation activities will be the development of a final Conceptual Site Model that will be used during the FS to assist in the development of the final site remedy. TRC has developed technically defensible conceptual site models for both the USEPA including in Region 6, and for TCEQ. In this experience, TRC has found that an initial Conceptual Site Model is necessary to identify data needs with revisions throughout the RI/FS to ensure data collected and analyzed meet the project goal. Based upon the Hazard Ranking System (HRS) model for this site, the wetlands and overland flow pathways are considered complete and credible. Consumption of fish from the adjacent wetlands and waterways is also regarded as a complete exposure pathway.

Health and Safety Plan

TRC provides training to all its employees whose work entails potential exposure to toxic chemicals or hazardous environments. The training is taught by experienced professionals including Certified Safety Professionals and Certified Industrial Hygienists. Training promotes safe work conditions through both classroom and field instruction. TRC will follow the previously approved Health and Safety Plan. TRC's rigorous training program, coupled with the site specific Health and Safety Plan, will ensure a safe project execution.

REMEDIAL INVESTIGATON IMPLEMENTATION AND REPORT

The remedial investigation and subsequent reporting is also key in the project implementation. For this effort, TRC will use the previously prepared and approved work plan to implement the field investigation.

The field portion of the remedial investigation can be implemented with minimal to no problems, provided upfront planning in conducted and experienced staff is mobilized. Stephen Halasz's site history will allow an efficient planning phase. Prior to mobilization, TRC will coordinate through NORCO for site access. While work plan adherence is key to compliance, site conditions may dictate a field modification is required for sample collection. Experienced staff is essential in evaluating when field modifications are required for project progress and compliance.

During the course of the project and at the completion of the RI phase, substantial reporting is required. Progress reports are required, typically on a monthly basis, reporting on both status and schedule. In addition to progress reports, a final RI report will be submitted presenting the data collected. The RI report is typically a voluminous document, with information presented

from the investigation. As in the work plans, TRC will focus on the goals of the project in all reports. TRC has also found that a printed summary report in conjunction with a supplemental CD-ROM minimizes production costs and highlights key project issues. TRC often provides one hard copy to the local document repository, with all other copies complete with a hard copy summary report and a CD-ROM with data, borings logs and other voluminous information.

A key goal is completion of the investigation is the proper allocation of responsibility for impacts to the environment. Other goals are development of a realistic conceptual site model of sufficient detail that can be used for the FS in the evaluation of remedial alternatives. Data generated will be used in completing the Risk Assessment Baseline and subsequently conducting the human health and ecological risk assessment. This human health and ecological risk assessments identify pathways to be addressed during the FS process.

FEASBILITY STUDY

TRC understands how to effectively use the results of the remedial investigation in identifying and developing remediation alternatives, including the no action alternative. TRC's proposed team has the ability to think outside the box. Dr. Killen, TRC's Feasibility Study Task Leader, has completed a large scale, sediment removal project. He designed and oversaw the construction, filling, and monitoring of a two acre biocell that was built to remediate sediments for a Sediment Removal Project. The biocell provides a secure and passive environment on the facility property, where over a period of approximately 10 years, the sediments contained within the biocell will be converted to useable, soil-like fill. While a biocell was not the technically "easiest" option to implement, the long-term liability and cost reduction provide it as a resourceful, successful action. TRC will apply this same technical expertise and site specific analysis to this site and the selection of the remedial alternatives and the preferred remedy.

Presented herein are the criteria specified by the EPA in the development of remedial alternative and in identifying the preferred remedy.

Identification of Site-Specific Applicable or Relevant and Appropriate Requirements to be Considered

According to CERCLA, one of the requirements of the FS process is to identify the Federal and State environmental regulations associated with the remedial alternatives being considered. Specifically, Section 121(d) of CERCLA and the National Oil and Hazardous Substances Contingency Plan (NCP), require that the selected remedial action for a site meet the following requirements:

- The remedial action must be protective of human health and the environment.
- The remedial action must comply with all Federal and State Applicable or Relevant and Appropriate Requirements (ARARs), if they exist, unless grounds for invoking a waiver of ARARs are provided.

These ARARs are used to assess remedial alternatives for the site. The requirements assure that remedial actions performed comply with all pertinent Federal and State environmental requirements. The requirements place controls on remedial actions to ensure protection of human health and the environment, as well as ensuring proper management of remediation waste.

While identifying ARARs is required in the FS submissions, TRC recommends establishing ARARs early in the RI/FS process. Typically, TRC works closely with the EPA Federal Project Manager early in the process for two reasons. First, an initial agreement ensures the

remaining investigation activities are focused on data acquisition and analysis as needed. Second, and equally important, should citizen or organized groups decide to litigate, the EPA has already approved the process thus shielding NORCO from litigious action.

Remediation Goals

The EPA's, and TRC's, recommended approach for developing remediation goals is to identify preliminary remedial goals at the start of the project, modify the goals as needed after the RI or during the FS, and select final remediation levels in the Record of Decision (ROD). Goals are established based on site-specific information from the baseline risk assessment. The risk assessments conducted as part of the process will be key in the refinement of the conceptual site model, identifying the concentration limits protective to human health and the environment in each of the media impacted (soils and water). TRC has identified key personnel who will identify the key receptors, both human and ecological, the appropriate sampling methods, number and type of samples and develop the risk assessment and assist in the development of the site conceptual model.

TRC is in a unique position to support NORCO in this endeavor with a proven record of success. Our local team is ready to start this vital project.

During the RI/FS project, TRC may determine that several operable units (OUs) are beneficial in achieving remedial goals. One OU remedial goal may not be applicable, or implementable, at another depending on the site impact and identified receptors. TRC will not only look at remedial goals, but also determine if individual goals are more achievable than a holistic approach.

TRC is very accustomed with the behavior of PCBs and other potential chemical of concern in sediments and available remedies (i.e., no further action, capping, stabilization, dredging). TRC has recently prepared cost estimates for implementing these and other technologies at other sites. Dr. Killen's innovative, thorough technical expertise, coupled with past project experiences, will ensure the FS generates a cost-effective and technically sound solution for this site.

REMEDIAL DESIGN/REMEDIAL ACTION

TRC will help expedite site remediation, if needed, through our knowledge and experience at similar sites. The experience of the project manager, and project team, will fast track the project to a successful remedial action. Very few firms can bring significant experience in planning and designing the Superfund sites. TRC is that rare firm. We are aware of the sensitivity of the surrounding community and can use that awareness for a successful remedial action.

CONCLUSION

TRC has a unique combination of unsurpassed qualifications. Our **Ownership, Experience and Expertise, and Partnership** provide a clear distinction from the rest. We are 100% committed to client satisfaction. TRC's experience as an owner of similar projects, our expertise, and our previous work with NORCO as a partner shows that we can work together to resolve regulatory uncertainty and expedite remedial implementation cost effectively.

APPENDIX A

ADDITIONAL CASE HISTORIES

Case History #1—AT&SF Clovis Superfund Site

Project Name/Location:

AT&SF Clovis Superfund Site, Clovis, New Mexico

Phase of Work:

RD, RAO, O&M

Waste Management Technology:

Dewatering, Bioremediation, Containment

TRC's Role in the Project:

Prime

Client Contact:

Burlington Northern & Santa Fe Railway Company (BNSF)
Rob Werner, Manager
Environmental Remediation
4200 Deen Road
Ft. Worth, Texas 76106-3099
(817) 740-7341
Robert.Werner@bnsf.com

Contract Scope and Total Project Costs:

TRC: $2,782,285 (design, oversight, O&M, misc. support)
Subcontracts: $1,603,100 (remedial construction)

Period of Performance:

1999-2002

TRC Segment/Region:

TRC Central Region

Project Team:

Project Manager:
Tim Wippold, P.E.
Project Engineer:
Tim Wippold, P.E.
Key Technical Personnel:
Pam Krueger
Marty Briggs, P.E.
Charles Thomas, P.G.
Erik Beiergrohslein, P.E.

All still with TRC in the Houston and Austin offices.

Services, Areas of Expertise, Relevant Experience:

TRC staff personnel have been conducting remedial design/ remedial action oversight (RD/RAO) projects at the AT&SF Clovis Superfund Site for more than 15 years. In the last five years, TRC has, on behalf of the responsible party, overseen the final remediation, prepared the closure design, supervised final closure, prepared the closure construction report, and assisted in deleting the site from the National Priorities List (NPL).

The AT&SF Clovis Superfund Site consists of the Santa Fe Lake, a natural playa lake, and surrounding uplands. The site is located approximately one mile south of the present-day Burlington Northern and Santa Fe (BNSF) railyard in Clovis, New Mexico, and encompasses approximately 100 acres. Since the early 1900s, the lake received storm water run-off and wastewater discharge from the railyard. In the Administrative Order on Consent signed with the Environmental Protection Agency (EPA) on September 1, 1983, AT&SF agreed to perform RD/remedial action (RA) activities and pay costs for cleaning up the site. The Record of Decision (ROD) was issued in 1988.

The RA was completed in three phases. The objective was to reduce the concentration of petroleum hydrocarbons in soils and sediments and to confine the material containing elevated metals to prevent leaching. Between 1989 and 1999, TRC staff personnel designed and oversaw construction/implementation of a rainfall run-on/runoff control system and a lake water evaporation system, dewatering and *ex-situ* bioremediation of contaminated lake bottom sediments, *in-situ* and *ex-situ* bioremediation of contaminated soils beneath the lake bottom sediments and from the beach area, containment of all treated sediments and any treated soils not meeting the clean-up criteria in an onsite storage facility (OSF).

Since 1999, TRC has completed restoration of the site, including capping of the OSF, demolition of the run-on control dike, and revegetation of the site with native grasses. The activities associated with this phase began in June 2000 and were completed in October 2002. Construction completion was declared on September 20, 2002, through a Preliminary Closeout Report. The Superfund Division Director signed a Final Closeout Report on November 8, 2002.

TRC is currently conducting post-closure care activities, such as maintenance of the OSF cap and groundwater monitoring.

Classes of Contaminants:

Hydrocarbons
Metals

Media of Concern:

Sediment
Soil

Type of Plans and Specifications:

The RD included both performance-based and prescriptive-based specifications. Where specific materials or methods were required, prescriptive specifications were prepared. Where the objective was to accomplish a level or standard (e.g., volume, constituent concentration, percent compaction, moisture content, etc.), performance specifications were prepared.

Type of Contract:

TRC is contracted as the Owner's Engineer. Construction was bid out to a third party.

Problems and Corrective Actions Implemented:

None.

Case History #3—AT&SF Albuquerque Superfund Site

Project Name/Location:

AT&SF Albuquerque Superfund Site, Albuquerque, New Mexico

Phase of Work:

FS, RD, RAO, O&M

Waste Management Technology:

Solidification/Stabilization, Capping, Run-on/Run-off Management, Pump and Treat, Disposal

TRC's Role in the Project:

Prime

Client Contact:

Burlington Northern & Santa Fe Railway Company (BNSF)
Dave Clark, Director Environmental Remediation
920 SE Quincy
Topeka, Kansas 66601-1738
(785) 435-2210
David.Clark@bnsf.com

Contract Scope and Total Project Costs:

TRC: $1,500,000 to date (FS, RD, RAO, groundwater monitoring)
Subcontract: $200,000 (drilling, laboratory analytical)

Period of Performance:

1999-2030 (estimated)

Segment/Region Responsible:

TRC Central Region

Project Team:

Project Manager:
Dr. Riaz Ahmed, P.E., P.G.
Project Engineer:
Erin Trail, P.E.
Key Technical Personnel:
Jim Kain, P.E.
Mike Dubayeh, P.E.
Arsin Sahba, P.G.
Scott Reed
Jason Leik, P.E.
Steve Miller
Greg Hodge, P.G.

All still with TRC.

Services, Areas of Expertise, Relevant Experience:

TRC is the Owner's Engineer for remediation of a major railroad tie treating plant in Albuquerque, New Mexico, that has contaminated soil, contaminated groundwater, and dense non-aqueous phase liquid (DNAPL). The engineering services that TRC has completed and is completing at the site include feasibility studies (FS), oversight of interim remedial actions, operation and maintenance of interim remedial systems, and design of the remedy specified in the Record of Decision (ROD) and Consent Decree for the site. Summaries of the engineering services provided in the last five years are provided below.

Feasibility Studies. TRC prepared two FSs—one for groundwater and one for soil. Both studies evaluated remedial technologies based on Environmental Protection Agency (EPA) guidelines. The Soil FS evaluated the following remedial technologies: excavation and disposal, on-site capping, ex-situ solidification/stabilization, in-situ solidification/stabilization, ex-situ soil washing, ex-situ bioremediation, and off-site incineration. The Groundwater FS evaluated both in-situ and pump and treat remedial technologies. In-situ technologies evaluated were steam flushing, co-solvent/alcohol flooding, and in-situ oxidation. Pump and treat technologies evaluated were cavitation/oxidation, UV-oxidation, biological treatment (fixed film and fluidized granulated activated carbon bed), clay adsorption, and carbon adsorption.

Remedial Design for Site Soils. TRC is currently preparing the remedial design for the soil remedy prescribed in the ROD, which is in-situ solidification/stabilization, capping, and run-on/run-off management. The stabilized soil must have a compressive strength of at least 20 pounds per square inch and a permeability of 1×10^{-6} centimeters per second. TRC has performed a treatability study on site soils to determine the stabilization mix. Test mixtures evaluated included combinations of the following materials: Portland cement, Class C flyash, Class F flyash, sodium silicate, and bentonite. Treatability results showed that a design mix of Portland cement and bentonite will achieve the required design parameters.

Remedial Design for Site Groundwater. The groundwater remedy prescribed in the ROD is performance based, and must consist of the following elements: groundwater restoration through pump-and-treat, DNAPL source removal, and hot spot treatment. TRC has written the Treatability Study Work Plan, which outlines the tests and procedures for evaluating the treatment technologies listed in the Groundwater FS. Testing will include hydrogeologic testing (step-draw down and pump testing), laboratory/bench-scale testing, and on-site pilot testing (pump and treat and in-situ).

Classes of Contaminants:

Soil:
- PAHs (creosote)
- Zinc

Groundwater:
- PAHs (creosote)
- SVOCs
- Benzene

Media of Concern:

Soil
Groundwater

Remedial Action Oversight. In 1999, TRC oversaw the removal and disposal of approximately 11,000 cubic yards of creosote sludge and process residue from the site. TRC also installed five DNAPL recovery pumps in 1999, which are operated on a quarterly basis to remove DNAPL from the aquifer.

Operations and Maintenance. TRC performs groundwater monitoring, in accordance with the ROD and operates the DNAPL recovery pumps on a quarterly basis

Type of Plans and Specifications:

The remedial design included both performance-based and prescriptive-based specifications. Where specific materials or methods were required, prescriptive specifications were prepared. Where the objective was to accomplish a level or standard (e.g., volume, constituent concentration, percent compaction, moisture content, etc.), performance specifications were prepared.

Type of Contract:

TRC is contracted as the Owner's Engineer. Construction activities are competitively bid and not performed under a design-build contract.

Problems and Corrective Actions Implemented:

None.

Case History #4—Feather River Superfund Site

Project Name/Location:

Feather River Superfund Site, Oroville, California

Phase of Work:

RD, RAO

Waste Management Technology:

Excavation, Disposal, Capping

TRC's Role in the Project:

Prime

Client Contact:

KOPPERS Company, Inc.
Michael Bollinger
One Oxford Centre, Suite 3000
301 Grant Street
Pittsburgh, Pennsylvania 15219
(412) 208-8864

Contract Scope and Total Project Costs:

TRC: $1,500,000 (design and oversight)
Subcontract: $250,000 (drilling, geotechnical, and laboratory)

Period of Performance:

1994-1999 (RD)
1999-2003 (RAO)

Segment/Region Responsible:

TRC Western Region

Project Team:

Project Manager:
Ian Hutchison, P.E.
Project Engineer:
Scott Brown, P.E.
Key Technical Personnel:
Jim Juliani
Tom Patterson
Jim Carter, R.G.

All still with TRC.

Services, Areas of Expertise, Relevant Experience:

The Feather River site in Oroville, California, is a wood treating and storage facility that has been operating since the late 1940s. The wood treatment processes and associated chemicals used on site include volatile organic compounds (VOCs), metals, and dioxins/furans. Spillage from the process transfers and pipelines, and drippings from treated wood have resulted in soils that have been affected by the various constituents. A potential threat to regional ground water was identified.

TRC has provided engineering and construction services at this site since 1994 including management oversight of three phases of landfill construction in 1996, 1997, and 2002. The project required construction of a 6-acre double geocomposite bottom liner and leachate collection and removal system (LCRS), soil excavation and disposal in the landfill, temporary closure of the landfill and reopening, final soil removal and disposal, and closure of the landfill with a GCL/LLDPE/geocomposite and soil closure cap. TRC was responsible for design, all agency interaction (EPA Region IX, RWQCB, and DTSC), construction bidding (earthwork and geosynthetic materials), construction management/oversight, contract administration, issue resolution, and construction quality assurance (CQA) activities.

TRC developed a complete set of construction documents (including construction drawings, specifications, CQA Plan, Health and Safety Plan, schedule, contract conditions, and an Engineer's estimate) involving excavation and onsite relocation of 125,000 cubic yards of contaminated soils into Class I lined cells with a composite closure cap. The cells are equipped with the required double composite liner systems and a composite cap. Our team then managed the construction and performed QA/QC during completion of the cells.

Project costs were reduced by permitting and using local borrow materials along with sound competitive bidding practices. Total project cost was about $12 million. The approved remedy has resulted in savings of several million dollars compared with alternative treatment or offsite disposal options.

TRC
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Classes of Contaminants:

VOCs
Metals
Dioxins/Furans

Media of Concern:

Soil

Type of Plans and Specifications:

The remedial design included both performance-based and prescriptive-based specifications. Where specific materials or methods were required, prescriptive specifications were prepared. Where the objective was to accomplish a level or standard (e.g., volume, constituent concentration, percent compaction, moisture content, etc.), performance specifications were prepared.

Type of Contract:

TRC was contracted as the Owner's Engineer. Remediation was not being conducted under a design-build contract. Construction was bid out to a third party. TRC provided construction oversight.

Problems and Corrective Actions Implemented:

None.

Case History #6—JH Baxter Superfund Site

Project Name/Location:

JH Baxter Superfund Site, Weed, California

Phase of Work:

RD, RAO

Waste Management Technology:

Excavation, Containment, Bioremediation

TRC's Role in the Project:

Prime

Client Contact:

Beazer East, Inc.
Mike Tischuk
1 Oxford Center, Suite 3000
Pittsburg, Pennsylvania 15219
(412) 208-8809
tischukm@hansonle.com

Contract Scope and Total Project Costs:

TRC: $3,000,000 (design, oversight)
Subcontract: $75,000 (drilling)

Period of Performance:

1998-2002

Segment/Region Responsible:

TRC Western Region

Project Team:

Project Manager:
Ian Hutchison, P.E.
Project Engineer:
Steve Huvane, P.E.
Key Technical Personnel:
Tom Patterson
Jim Carter, R.G.
Troy Gill, E.I.T.
All still with TRC.

Classes of Contaminants:

VOCs
Metals
PAHs
DNAPL

Media of Concern:

Soil
Groundwater

Services, Areas of Expertise, Relevant Experience:

TRC performed strategic planning to demonstrate that remedy costs could be reduced from $40-60 million for the ROD surface and subsurface soil excavation, treatment, and disposal plan, to under $15 million with an equal or superior level of protection.

For surface soils, TRC performed a site risk assessment to demonstrate to the EPA that limited excavation of "hot spots" and covering operational areas with asphalt surfacing eliminated significant potential human health and environmental impacts. TRC also was successful in gaining EPA approval, and then designed and oversaw construction of an onsite Class I landfill to contain the excavated soils and has demonstrated that very limited treatment is necessary under these disposal conditions. This resulted in considerable cost savings compared to other treatment or disposal options.

For groundwater, TRC designed and oversaw construction of a slurry wall to contain DNAPL. This remedy substantially reduced groundwater treatment costs. TRC also designed a 130-gpm-groundwater treatment plant for groundwater within the slurry wall and storm water runoff area. The plant design included treatment of three influent streams: a small flow with high organics concentrations and high metals concentrations, a stream with high metals concentrations and low organics, and a low organics/no metals stream. The system design includes DNAPL separation, biological treatment and carbon polishing for the organics; metals treatment included pH adjustment, metals precipitation with alum, and sludge management systems.

TRC acted as the Design Engineer and QA/QC Engineer during the construction of the approximately 3,538 linear foot (184,000 square foot) soil-bentonite cutoff wall to a maximum depth of 52 feet. The cutoff wall, with a maximum permeability of 5×10^{-7} cm/sec, provides isolation of contaminated soils and groundwater. A soil-cement-bentonite section was constructed around a railroad crossing. This section with a maximum permeability of 5×10^{-7} cm/sec. and an unconfined compressive strength of 50 psi protected the stability of the railroad crossing. Also, the project included construction of a groundwater collection trench outside the slurry wall to divert water from the high groundwater elevations and prevent overtopping of the slurry wall. A cap consisting of a geogrid and compacted soil was constructed over the completed slurry wall and collection trench.

Type of Plans and Specifications:

Performance- and prescriptive-based specifications.

Type of Contract:

TRC is contracted as the Owner's Engineer.

Problems and Corrective Actions Implemented:

None.

TRC's design and oversight activities included the following:

- Removal and/or replacement of railroad and tram tracks, pavement, and buried utilities
- Site clearing, grading, fence removal, and removal of surface soils containing residual ROD constituents
- Preparation of a working surface platform parallel to the slurry wall trench and areas for mixing the slurry
- Installation of slurry-wall-level control wells, trenching and piping to transport the extracted water to the existing onsite water treatment plant
- Excavation of the slurry wall trench (~65 linear feet per day); a 60-foot-wide construction zone was necessary
- Modifications to the existing water treatment plant to expand capacity to 130 gpm, including installation of treatment equipment, piping, tanks, pumps, and a control system
- Construction of a work pad along the entire length of the slurry wall to prevent bentonite slurry from spilling over the lower end of the trench during backfilling
- Construction of a gravel drainage trench on the outside of the slurry wall to mitigate expected groundwater rises caused by construction of the slurry wall
- Capping of the slurry wall and gravel drainage to restore surface conditions
- Capping required use of high-strength geo-grids to span or bridge the width of the trench in some areas, to support site traffic over the slurry wall
- Modifications to Roseburg water treatment plant to operate reliably at capacity of 50 gpm including installation of a sediment clarifier and relocation and installation of other existing treatment equipment, piping, tanks, and pumps
- Testing and installation of facilities
- Groundwater modeling for Conceptual (30%) Design
- Full-time, onsite QC and engineering during construction of the slurry wall and gravel drainage trench, including verification testing, construction observation and inspection, problem identification and corrective measures, As-Built sketch logs, and review of contractor submittals and data
- Preparation of As-Built drawings

The project was completed in four months with minimal disruptions to the owner's operations.